

## 4.0 RCRA SITE CLOSEOUT PROCESS

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This section of the guide addresses the RCRA requirements and should be used by the restoration project team to plan and tailor their site closeout efforts, and to facilitate the environmental site closeout process at their installation. It is not intended to be a prescriptive document that must be followed explicitly. The RCRA guidance and information described in this section provide the DoD Component RPM/BEC a flexible management tool that can be applied to the specific situations at each installation.

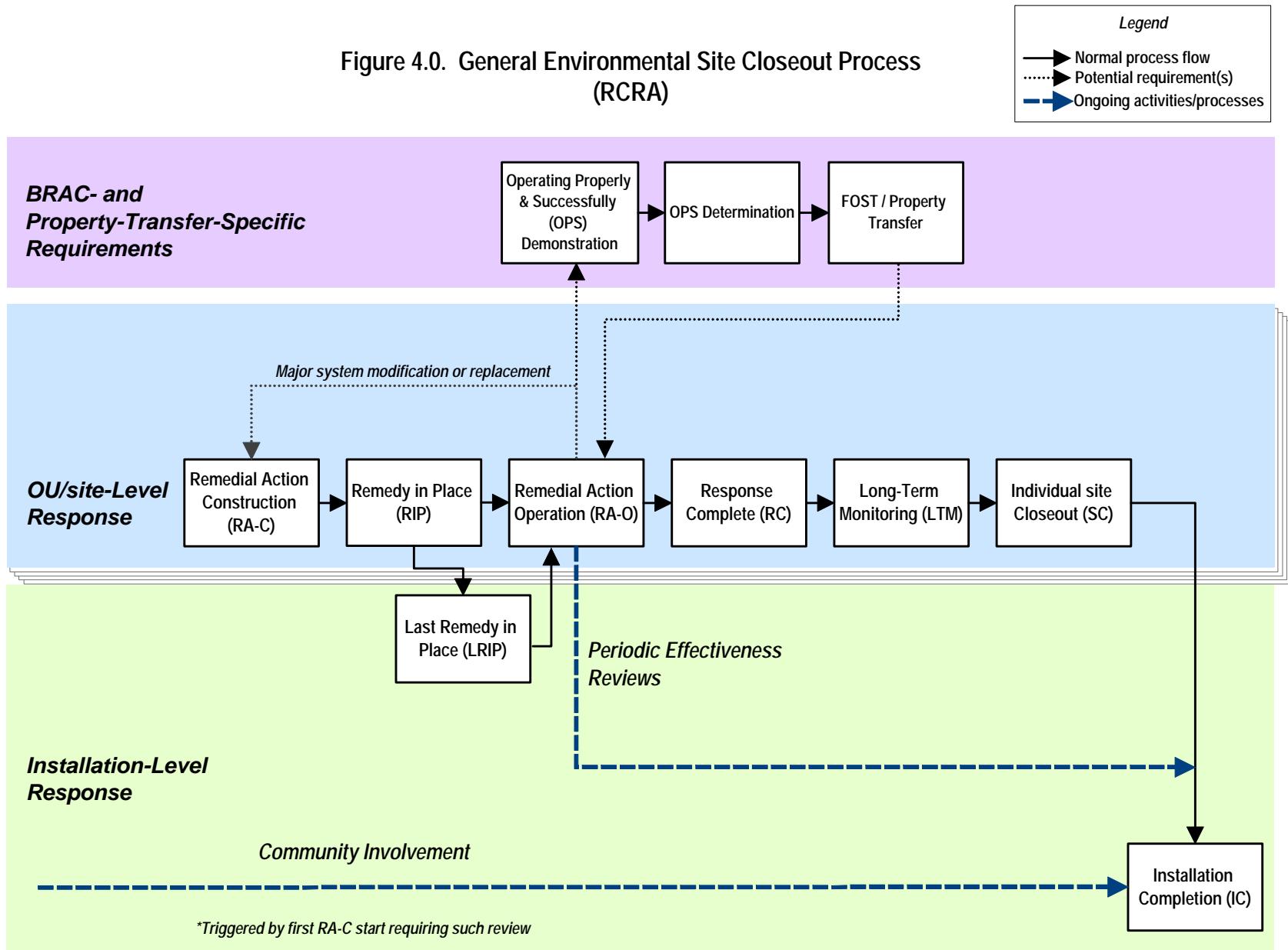
Users of this section should recognize that in most cases only a portion of these requirements would apply at a particular installation. Restoration project team members should discuss the most effective manner of integrating and applying these requirements at their installation. A set of tools, information, and considerations with which to develop a site closeout strategy for an installation is presented. Not every installation will require all the tools.

Site closeout under RCRA can follow two paths, one for closeout of active, regulated units and the other for closeout of corrective actions at inactive solid waste management units (SWMUs). Table 4.0-1 highlights the respective milestones for these two regulatory frameworks (and compares them to DoD terminology), and Section 4.8 includes a brief discussion of their similarities and differences.

Major milestones, phases, and documentation requirements for the site closeout process under RCRA are identified in Figure 4.0 and Table 4.0-2. Even though operating properly and successfully (OPS) demonstrations are defined in CERCLA regulations, it should be noted that they are necessary for any transfer of property, whether or not the site is undergoing a RCRA or CERCLA closeout.

In the following subsections, figures and accompanying tables describe an overall framework for closeout of sites under RCRA. The figures in the following subsections are all consolidated into a single foldout flowchart at the end of this section. The information is a compilation of existing laws, regulations, policies, and guidance, and assigns responsibilities for each task to a **Lead** (the person/organization primarily responsible for task execution) and **Coordination/Concurrence** (the persons/organizations that must assist in, coordinate on, review, concur with, and/or approve task execution). For NPL sites, these coordination/concurrence roles are generally well-defined; at non-NPL sites, the respective roles of EPA and the state may require further definition. In the accompanying flow charts, task boxes with the □ shape indicate tasks that are primarily documentation requirements.

Figure 4.0. General Environmental Site Closeout Process (RCRA)



**Table 4.0-1. Comparison of DoD and RCRA Phases, Milestones and Terminology**

DoD IRP Phases/Milestones	EPA RCRA Phases/Milestones	
	Closure and Post- Closure Permits (Waste in Place)	Corrective Action
<i>Source: Department of Defense Reporting Conventions (Restoration Management Information System; Management Guidance for DERP)</i>	<i>Source: 40 CFR Chapter I, Parts 260, 261, 262, 263, 264, 265 and 270</i> <b>APPLIES TO REGULATED UNITS</b>	<i>Source: RCRIS Data Element Dictionary, January 1995</i> <b>APPLIES TO SOLID WASTE MANAGEMENT UNITS (COULD INCLUDE REGULATED UNITS)</b>
Site Discovery	Part A Permit Notification	
PA/SI Completion		RCRA Facility Assessment
		National Corrective Action Prioritization System (NCAPS)
Remedial Investigation (RI)	Closure Plan and Post-Closure Permit Application	RCRA Facility Investigation Imposed by Permit or Order
Interim Remedial Action		Interim/Stabilization Measures
Relative Risk Reduction		
Feasibility Study (FS)	Closure Plan	Corrective Action Plan (CAP), Corrective Measures Study (CMS)
Record of Decision	Closure Plan Approval and Post Closure Permit Issuance	Statement of Basis
Remedial Design (RD)	Closure Plan Implementation and Ground Water Cleanup	
Remedial Action (RA)		
Remedial Action Construction (RA-C)		Corrective Measures Implementation Plan
	Closure Certification	Certification of Remedy Completion or Construction Complete
Remedy in Place (RIP)		
Remedial Action Operation (RA-O)		
Response Complete (RC)		
Long Term Monitoring	Post Closure Permit	
	Terminate or Reissue 10 Year Post-Closure Permit	
Site Closeout	Post-Closure Permit Expiration	Corrective Action Process Terminated

Table 4.0-2. Summary of RCRA Site Closeout Documentation Requirements\*

Document	Also CERCLA Requirement	Applicability			Purpose/Function
		Site	OU	Inst.	
Remedy in Place (RIP)					
Certification of Remedy Complete		✓	✓		For RCRA units, documents that physical construction is complete and unit is operating as designed
Remedial Action Operation (RA-O)					
Corrective Measures Progress Report(s)		✓	✓		For RCRA units, documents that corrective action is performing properly in accordance with the closure performance standard
Public Notice/Comment for Remedy Alterations	✓	✓	✓		When a remedy must be altered because cleanup goals are not being achieved (e.g., through a ROD amendment or modified corrective action plan), public notice/ comment is generally required
Corrective Measures Completion Report		✓	✓		
Response Complete (RC)					
Long Term Monitoring Plan	✓	✓	✓		A general plan indicating how a successful RA will continue to be monitored to ensure that the remedy remains effective
Class 3 Permit Modification		✓	✓		Deletes from an active permit a SWMU for which corrective actions have been completed
Public Notice of Permit Modification		✓	✓		Notifies the public of the proposed permit modification and solicits comments
Response to Comments		✓	✓		Responds to comments received during the public comment period
Closure Plan		✓	✓	✓	Explains in detail how an owner/operator [DoD] will achieve the closure performance standard reference 40 CFR 264.111 and 265.111
Certification of Closure		✓	✓	✓	Certifies that a hazardous waste management unit or facility has closed in accordance with the approved closure plan
Post-Closure Notices		✓	✓	✓	Contains notification in property deed of Post-Closure Permit hazardous waste activities.
Long-Term Monitoring (LTM)					
Post-Closure Monitoring and Maintenance Plan		✓	✓	✓	Describes planned maintenance and groundwater monitoring to ensure continued integrity of remedy
Post-Closure Plan		✓	✓	✓	When units cannot clean-close, this plan (generally part of the facility's overall permit) ensures that appropriate monitoring & maintenance activities are conducted
Public Notice of Permit		✓	✓	✓	Notifies the public of the proposed post-closure permit or permit modification (where applicable) and solicits comments
Response to Comments		✓	✓	✓	Responds to comments received during the public comment period for the post-closure permit or for permit modifications
Site Closeout (SC)					
Certification of Completion of Post-Closure Care		✓	✓	✓	Certifies that the post-closure care period was performed in accordance with the approved closure plan
Public Notice of Post-Closure Care Completion		✓	✓	✓	Notifies the public that post-closure care has been completed
RCRA Permit Termination				✓	Terminates the RCRA permit/order under which installation restoration occurred

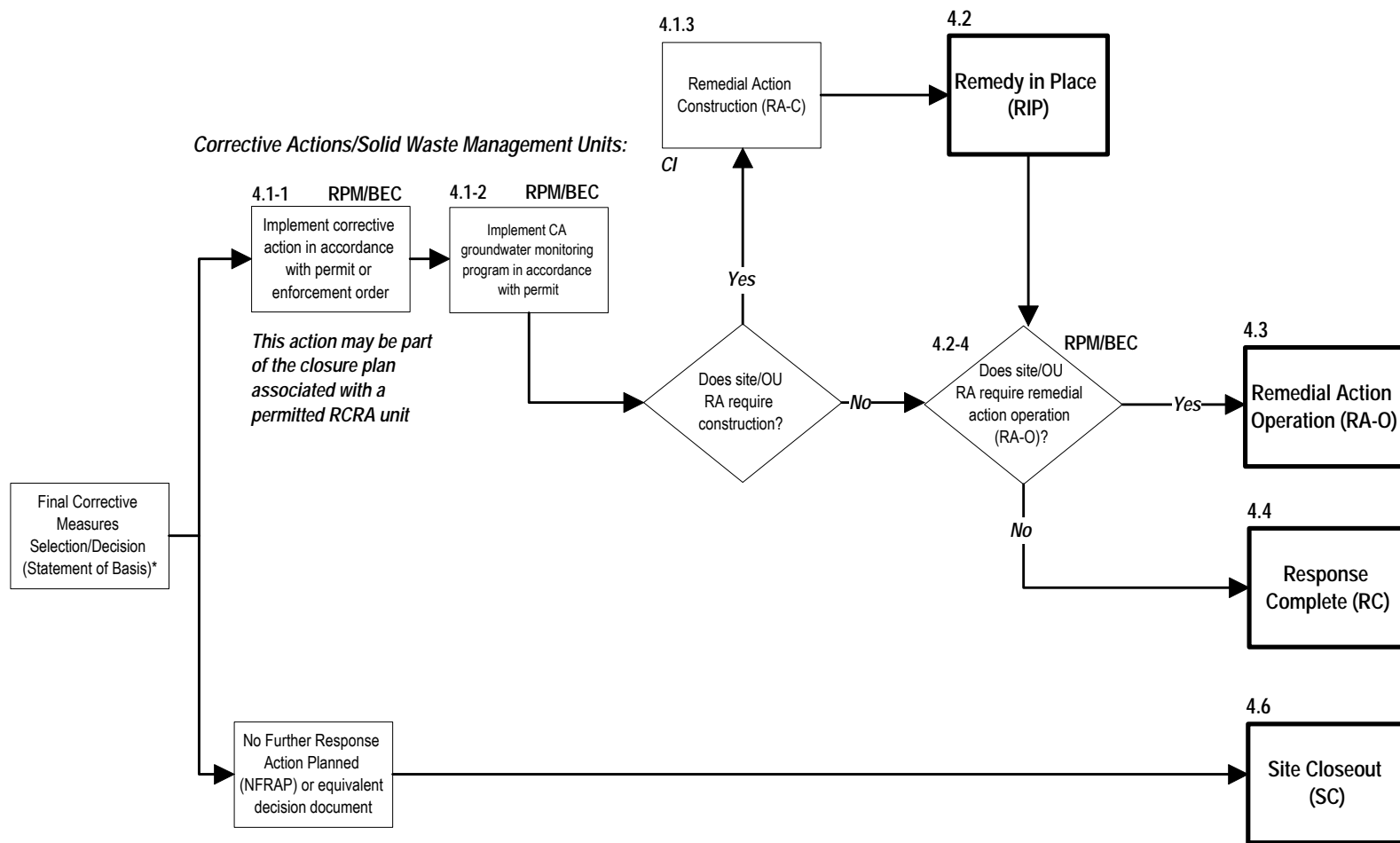
\* A list of example documents are listed in Section 9, many of which can be attained on the Environmental Site Closeout website, <http://www.afbca.hq.af.mil/closeout>.

## 4.1 Remedial Action Construction (RA-C)

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Much guidance has already been prepared to address the initial steps of the environmental restoration process, including Remedial Action Construction. As a result, Figure 4.1 and Table 4.1 only include task guidance and information for RA-C at a high level. Readers can refer to other sources of guidance for more information on RA-C (see Section 9 for other sources). Subsequent steps of the Site Closeout Process are discussed in greater detail.

Figure 4.1. Remedial Action Construction (RCRA)



CI denotes Community Involvement

\*IRAs and Removal Actions require final decision document

**TABLE 4.1 REMEDIAL ACTION CONSTRUCTION (RCRA)**

*This Table accompanies Figure 4.1, Remedial Action Construction (RCRA)*

TASK NUMBER	TASK NAME	LEAD	COORD./ CONCUR	TASK GUIDANCE AND INFORMATION
	<b>REMEDIAL ACTION CONSTRUCTION (RCRA)</b>			
	Final Corrective Measures Selection/Decision (Statement of Basis)			<input type="checkbox"/> Previously conducted Interim Corrective Measures and/or Stabilization Actions under RCRA require a final decision document to confirm that actions taken constitute the full, required, final corrective action.
	No Further Response Action Planned (NFRAP) decision or equivalent decision document			<input type="checkbox"/> In certain cases, corrective action may have been proposed when, it is later determined, none is required. In such instances, the decision not to pursue corrective action should be documented in the appropriate decision document. <input type="checkbox"/> Proceed to task 4.6, <b>Site Closeout</b> .
4.1-1	Implement corrective action in accordance with permit or enforcement order	RPM/BEC		<input type="checkbox"/> <i>This action may be part of the closure plan associated with a permitted RCRA unit.</i> <input type="checkbox"/> The owner or operator must implement a corrective action program that prevents hazardous constituents from exceeding their respective concentration limits at the compliance point by removing the hazardous waste constituents or treating them in place. <input type="checkbox"/> The owner or operator must begin corrective action within a reasonable time period after the groundwater protection standard is exceeded. The Regional Administrator or state director will specify that time period in the facility permit. <input type="checkbox"/> If a facility permit includes a corrective action program in addition to a compliance monitoring program, the permit will specify when the corrective action will begin and such a requirement will operate in lieu of § 264.99(i)(2).
4.1-2	Implement CA groundwater monitoring program in accordance with permit	RPM/BEC		<input type="checkbox"/> In conjunction with a corrective action program, the owner or operator must establish and implement a groundwater monitoring program to demonstrate the effectiveness of the corrective action program. <input type="checkbox"/> Such a monitoring program may be based on the requirements for a compliance monitoring program under § 264.99 and must be as effective as that program in determining compliance with the groundwater protection standard under § 264.92, and in determining the success of a corrective action program under § 264.100(e), where appropriate.
	Does site/OU RA require construction?  <i>[If No, proceed to task 4.2-4]</i>			<input type="checkbox"/> Certain remedy types (e.g., excavation and offsite treatment of contaminated soil) may not require a construction phase. Other remedies (such as groundwater pump-and-treat) may require a lengthy construction period. The need for construction is determined as part of the corrective action selection/decision. See Section 2 for a discussion of remedy scenarios and the applicability of the RA-C phase to various types of remedies.
4.1-3	Remedial Action Construction (RA-C)	RPM/BEC		<b>Community Involvement</b> <i>Required</i> <input type="checkbox"/> Hold 45-day public-comment period; obtain public comment on Corrective Measures Implementation (CMI). <input type="checkbox"/> During this process, maintain dialogue with community members, keeping them apprised of activities during the CMI phase. <input type="checkbox"/> <i>For a list of additional activities you may want to consider, refer to Section 7.0, Community Involvement.</i>

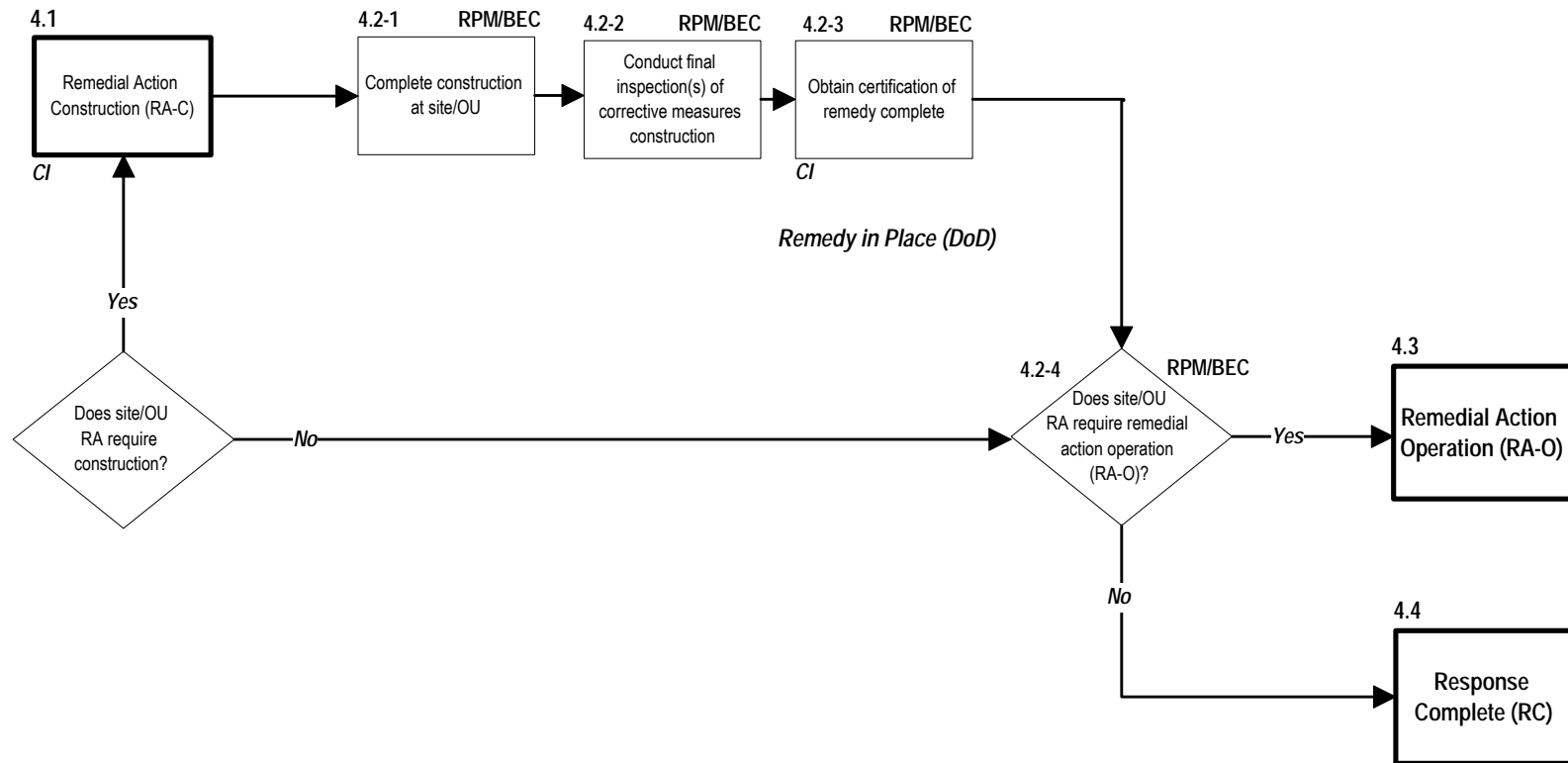
## 4.2 Documentation of Remedy in Place

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The process for Documentation of Remedy in Place is graphically shown in Figure 4.2 with accompanying task guidance and information in Table 4.2.



Figure 4.2. Documentation of Remedy in Place (RCRA)



CI denotes Community Involvement

TABLE 4.2 DOCUMENTATION OF REMEDY IN PLACE (RCRA)

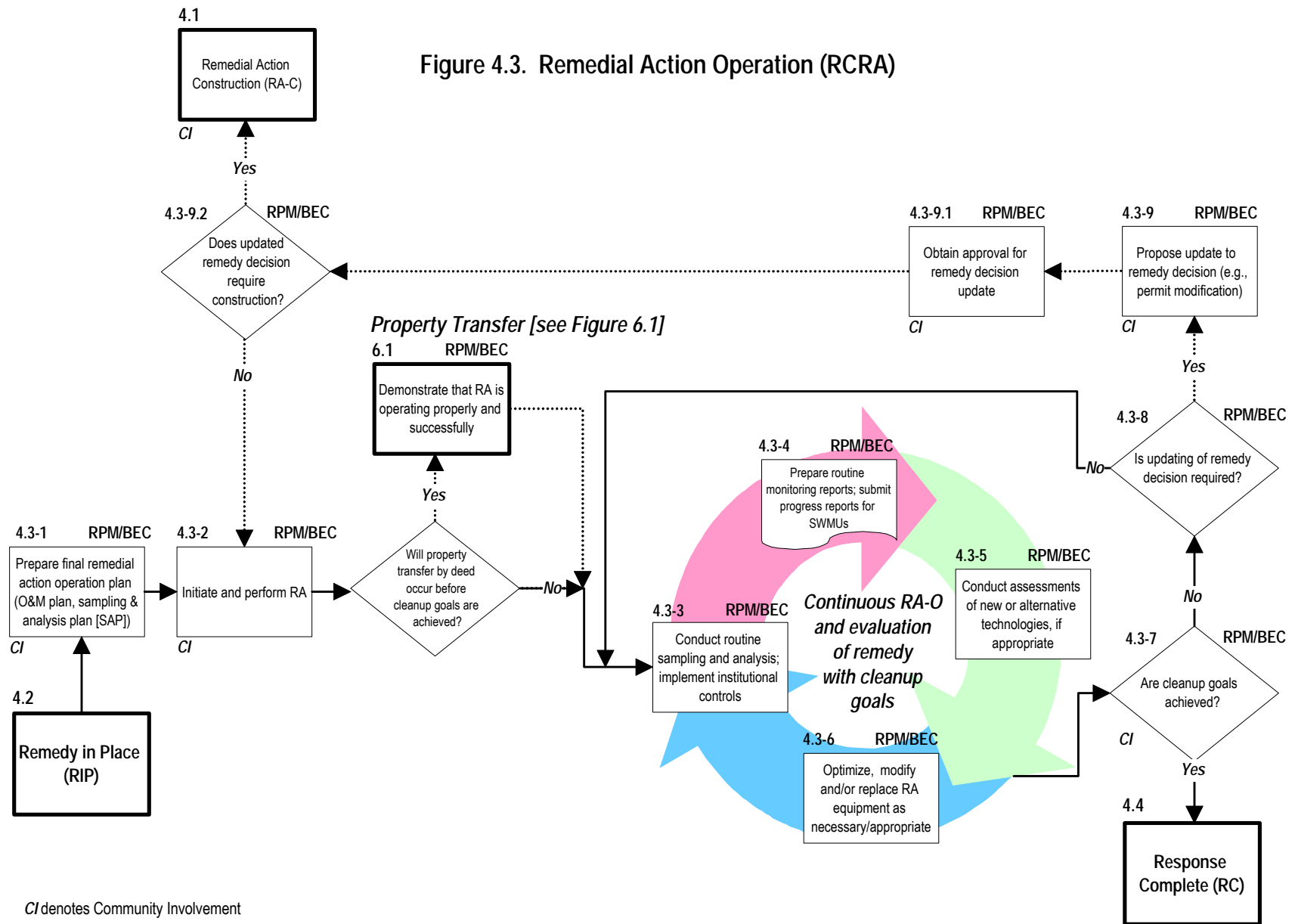
This Table accompanies Figure 4.2, Documentation of Remedy in Place (RCRA)

TASK NUMBER	TASK NAME	LEAD	COORD./ CONCUR	TASK GUIDANCE AND INFORMATION
	REMEDY IN PLACE (RCRA)			
4.2-1	Complete construction at site/OU	RPM/BEC		
4.2-2	Conduct final inspection(s) of corrective measures construction	RPM/BEC	EPA/state RPM	
4.2-3	Obtain certification of remedy complete	RPM/BEC	EPA/state RPM	<input type="checkbox"/> Regulatory agencies evaluate submission on remedy completion. <input type="checkbox"/> If agencies concur, proceed to Remedial Action Operation (RA-O). <b>Plan-Ahead Consideration:</b> <input type="checkbox"/> For BRAC facilities or facilities where property ownership is transferred, a determination must be made on permit modification (see also Sections 4.9 and 6.1). <ul style="list-style-type: none"> <li>• RPM/BEC conducts consultation with LRA to determine whether the LRA is willing to become a joint holder of the RCRA permit.</li> <li>• If so, then the RPM/BEC will prepare a request for a permit modification and submit to the appropriate regulatory authority.</li> <li>• If not, then corrective action will proceed under current permit holder and title will remain with the DoD Component until corrective action is complete.</li> </ul> <b>Community Involvement</b> <input type="checkbox"/> For a list of activities you may want to consider, refer to Section 7.0, Community Involvement.
4.2-4	Does site/OU RA require remedial action operation (RA-O)?  [If No, proceed to task 4.4, Response Complete]	RPM/BEC		<input type="checkbox"/> If the remedy is complete without an operation phase (e.g., a landfill cap), proceed to task 4.4, <b>Response Complete</b> <input type="checkbox"/> Otherwise, conduct Remedial Action Operation (RA-O) in accordance with permit/corrective action plan; proceed to task 4.3, <b>Remedial Action Operation</b> .

### 4.3 Remedial Action Operation (RA-O)

The process for Remedial Action Operation is graphically shown in Figure 4.3 with accompanying task guidance and information in Table 4.3.

Figure 4.3. Remedial Action Operation (RCRA)



**TABLE 4.3 DOCUMENTATION OF REMEDIAL ACTION OPERATION (RCRA)**

*This Table accompanies Figure 4.3, Documentation of Remedial Action Operation (RCRA)*

TASK NUMBER	TASK NAME	LEAD	COORD./ CONCUR	TASK GUIDANCE AND INFORMATION
	<b>REMEDIAL ACTION OPERATION (CERCLA/RCRA)</b>			
4.3-1	Prepare final remedial action operation plan (O&M plan, sampling & analysis plan [SAP])	RPM/BEC		<p><b>Community Involvement</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Seek community review/input on technical documents produced, and ensure public has access and is apprised of continuing activities.</li> <li><input type="checkbox"/> For a list of additional activities you may want to consider, refer to Section 7.0, Community Involvement.</li> </ul>
4.3-2	Initiate and perform RA	RPM/BEC		<ul style="list-style-type: none"> <li><input type="checkbox"/> Conduct corrective measures in a manner consistent with the Corrective Measures Implementation Plan.</li> </ul> <p><b>Community Involvement</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> For a list of activities you may want to consider, refer to Section 7.0, Community Involvement.</li> </ul>
	Will property transfer by deed occur before cleanup goals are achieved?	RPM/BEC		<ul style="list-style-type: none"> <li><input type="checkbox"/> [If Yes, proceed to task 6.1, Operating Properly and Successfully Demonstration]</li> </ul>
4.3-3	Conduct routine sampling and analysis; implement institutional controls	RPM/BEC		<ul style="list-style-type: none"> <li><input type="checkbox"/> These activities will likely be ongoing throughout the entire phase.</li> </ul>
4.3-4	Prepare routine monitoring reports; submit progress reports for SWMUs	RPM/BEC		<ul style="list-style-type: none"> <li><input type="checkbox"/> Evaluate performance of RA against cleanup goals.</li> <li><input type="checkbox"/> Submit the required progress reports to the appropriate regulatory agency.</li> </ul>
4.3-5	Conduct assessments of new or alternative technologies, if appropriate	RPM/BEC		<ul style="list-style-type: none"> <li><input type="checkbox"/> Comparison of the existing RA system against potential new alternatives will require detailed information about system performance.</li> </ul>
4.3-6	Optimize, modify and/or replace RA equipment as necessary/appropriate	RPM/BEC		<ul style="list-style-type: none"> <li><input type="checkbox"/> Assess the need for upgrade or replacement of RA equipment due to technological improvements, obsolescence, end of useful/expected life, or other factors. Consider associated costs, staffing, and related planning horizons.</li> <li><input type="checkbox"/> The ACC IRP Site Closure Guidance Manual includes detailed information on RA-O optimization.</li> </ul>
4.3-7	Are cleanup goals achieved?  [If Yes, proceed to task 4.4, Response Complete]	RPM/BEC		<ul style="list-style-type: none"> <li><input type="checkbox"/> Documents specifying corrective measures implementation should include methods to determine when remedial goals have been achieved.</li> <li><input type="checkbox"/> EPA proposes that corrective measures be considered complete based on a three-part evaluation: <ul style="list-style-type: none"> <li>• The corrective measure has to have complied with all media cleanup standards;</li> <li>• All required source control actions will have to be completed; and</li> <li>• All specified procedures for removal and decontamination of units, equipment, devices, and structures will have to be complete.</li> </ul> </li> </ul> <p><b>Community Involvement</b></p> <p><i>Required</i></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> The public and affected community should be given notice and an opportunity to review and comment on all proposals to complete corrective measures.</li> </ul>

**TABLE 4.3 DOCUMENTATION OF REMEDIAL ACTION OPERATION (RCRA)**

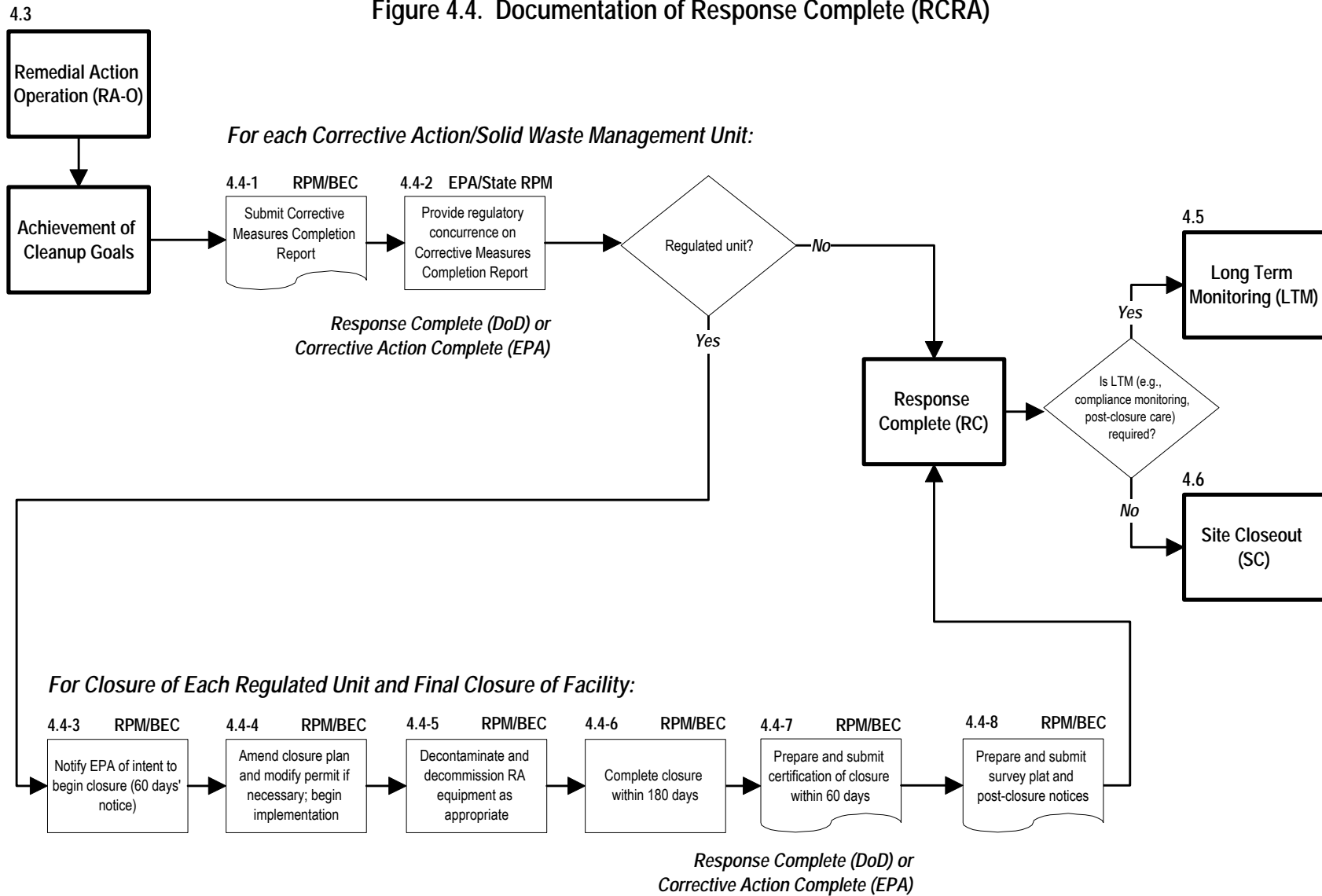
*This Table accompanies Figure 4.3, Documentation of Remedial Action Operation (RCRA)*

TASK NUMBER	TASK NAME	LEAD	COORD./ CONCUR	TASK GUIDANCE AND INFORMATION
4.3-8	Is updating of remedy decision required? <i>[If No, proceed to 4.3-3]</i>	RPM/BEC		<input type="checkbox"/> For additional information regarding strategies and considerations related to remedy updates and modifications, see Section 8.2.
4.3-9	Propose update to remedy decision (e.g., permit modification)	RPM/BEC	EPA/state RPM	<b>Community Involvement</b> <i>Required</i> <input type="checkbox"/> Public notice must be given if implementation of an approved corrective action plan for UST(s) does not achieve the established cleanup levels in the plan and termination of the plan is under consideration.
4.3-9.1	Obtain approval for remedy decision update	RPM/BEC	EPA/state RPM	<b>Community Involvement</b> <i>Required</i> <input type="checkbox"/> Accomplish appropriate community involvement, e.g., public notice/comment for permit modifications. See Section 4.9 for more information on remedy updates requiring permit modifications and associated community involvement requirements. <input type="checkbox"/> For a list of additional activities you may want to consider, refer to Section 7.0, Community Involvement.
4.3-9.2	Does updated remedy decision require construction? <i>[If Yes, proceed to task 4.1]</i> <i>[If No, proceed to task 4.3-2]</i>	RPM/BEC		<input type="checkbox"/> If Yes, return to Remedial Action Construction to implement RA modifications.

## 4.4 Documentation of Response Complete

The process for Documentation of Response Complete is graphically shown in Figure 4.4 with accompanying task guidance and information in Table 4.4. See Section 4.7 for a discussion of integration of corrective action and regulated unit closure requirements.

Figure 4.4. Documentation of Response Complete (RCRA)



CI denotes Community Involvement

**TABLE 4.4 DOCUMENTATION OF RESPONSE COMPLETE (RCRA)**

*This Table accompanies Figure 4.4, Documentation of Response Complete (RCRA)*

TASK NUMBER	TASK NAME	LEAD	COORD./ CONCUR	TASK GUIDANCE AND INFORMATION
	<b>RESPONSE COMPLETE (RCRA)</b>			
<i>For each Corrective Action/Solid Waste Management Unit:</i>				
4.4-1	Submit Corrective Measures Completion Report	RPM/BEC		<input type="checkbox"/> Determine whether corrective measure completion criteria have been met as specified in the Corrective Measures Implementation Plan. Demonstrate that the completion criteria have been met and summarize work accomplishments. Summarize inspection findings and total operation and maintenance costs.
4.4-2	Provide regulatory concurrence on Corrective Measures Completion Report	EPA/state RPM		<input type="checkbox"/> The Corrective Measures Completion Report will be reviewed to determine whether specified cleanup goals have been achieved.
	Regulated unit? <i>[If Yes, proceed to task 4.4-3]</i>			<input type="checkbox"/> If No, is LTM (e.g., compliance monitoring, post-closure care) required? <i>[If Yes, proceed to task 4.5]</i> <i>[If No, proceed to task 4.6]</i>
<i>For Closure of Each Regulated Unit and Final Closure of Facility:</i>				
4.4-3	Notify EPA of intent to begin closure (60 days' notice)	RPM/BEC		<input type="checkbox"/> For permitted units the owner/operator must notify the RA at least 60 days prior to the date on which he/she "expects to begin closure" of a surface impoundment, waste pile, land treatment or landfill unit, or final closure of a facility with such a unit (§264.112(d)).
4.4-4	Amend closure plan and modify permit if necessary; begin implementation	RPM/BEC		<input type="checkbox"/> All TSDFs must submit closure plans for both partial and final closure in accordance with §§264/265.112. These plans explain in detail how the owner or operator will achieve the closure performance standard under §§264/265.111. <input type="checkbox"/> Permitted facilities are required to submit a closure plan with the Part B permit application; the approved closure plan then becomes an enforceable component of the facility permit. Interim status facilities must have a written closure plan on the premises six months after the facility becomes subject to §265.112. <input type="checkbox"/> The closure plan may be amended by either the facility owner/operator or the RA by following the steps in §§264/265.112(c) when there is a change in the design or operation of the facility, a change in the expected closure date, or an unexpected event.
4.4-5	Decontaminate and decommission RA equipment as appropriate	RPM/BEC		<input type="checkbox"/> During partial and final closure periods all contaminated equipment, structures, and soils must be properly disposed of or decontaminated unless otherwise specified in the unit-specific closure requirements (§§264/265.114).
4.4-6	Complete closure within 180 days	RPM/BEC		<input type="checkbox"/> Once partial or final closure is initiated, closure activities must be completed within 180 days of receiving the final volume of hazardous waste (§§264/265.113(b)). <input type="checkbox"/> For interim status facilities, closure activities must be completed within 180 days of approval of the closure plan, or within 180 days of receiving the final volume of hazardous waste, whichever is later.
4.4-7	Prepare and submit certification of closure within 60 days	RPM/BEC		<input type="checkbox"/> According to §§264/265.115, the owner/operator must submit to the RA (by registered mail) a certification that the hazardous waste management unit or facility has closed in accordance with the specifications in the approved closure plan. This submittal must take place within 60 days of completion of closure of each regulated unit and within 60 days of the completion of final closure.

**TABLE 4.4 DOCUMENTATION OF RESPONSE COMPLETE (RCRA)**

*This Table accompanies Figure 4.4, Documentation of Response Complete (RCRA)*

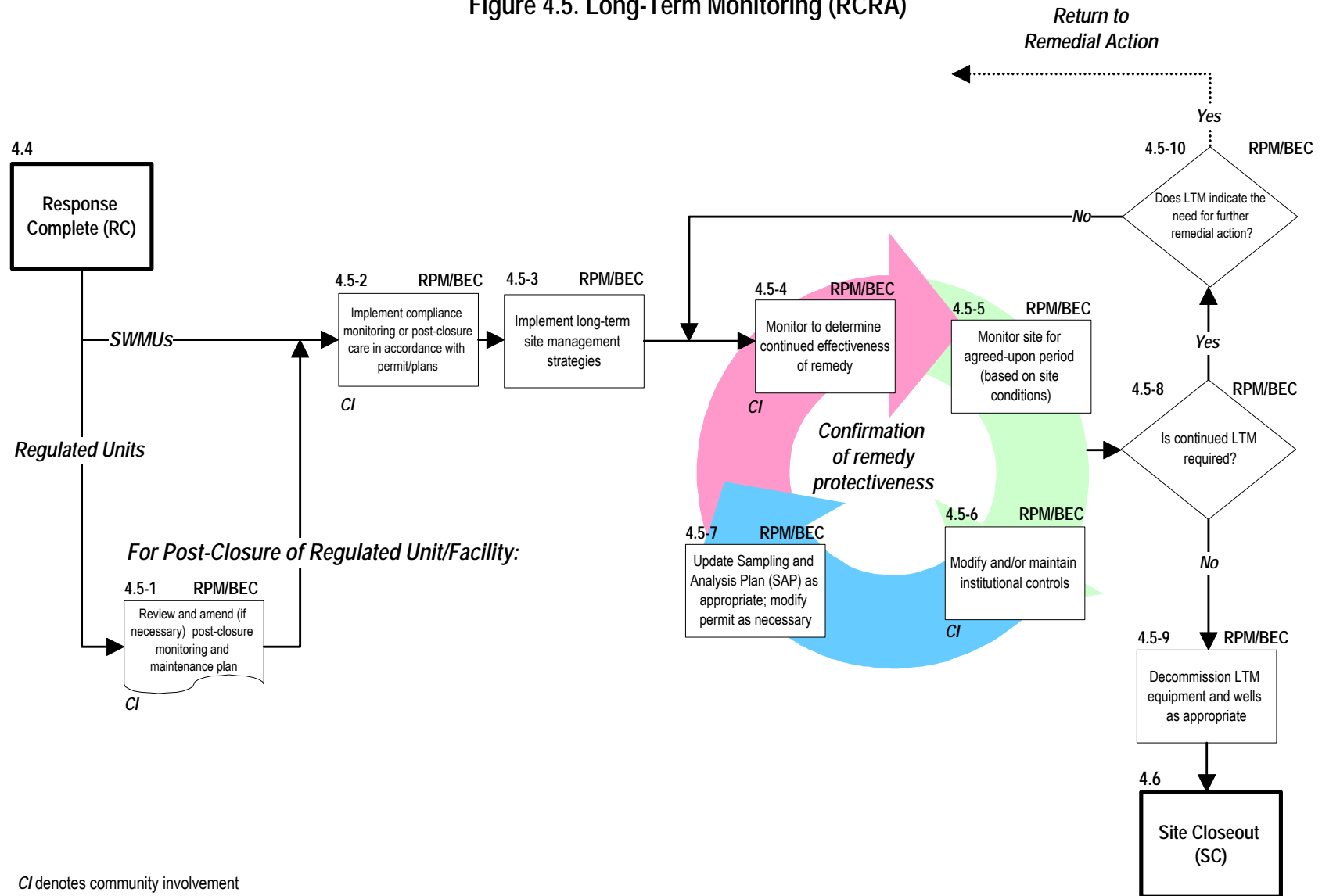
TASK NUMBER	TASK NAME	LEAD	COORD./ CONCUR	TASK GUIDANCE AND INFORMATION
4.4-8	Prepare and submit survey plat and post-closure notices	RPM/BEC		<input type="checkbox"/> The owner/operator must submit to the local zoning authority, or the authority with jurisdiction over local land use, and to the EPA Regional Administrator a survey plat indicating the location and dimensions of the hazardous waste units (§§264/265.116). <input type="checkbox"/> The survey plat must be submitted no later than the submission of certification of closure of each hazardous waste disposal unit. <input type="checkbox"/> Within 60 days after closure certification (by a registered engineer or qualified soil scientist), the local zoning or land use authority and the RA must receive a record of the type, location, and quantity of hazardous wastes in each disposal unit (§§264/265.119). <input type="checkbox"/> Is LTM (e.g., compliance monitoring, post-closure care) required? <i>[If Yes, proceed to task 4.5, <b>Long-Term Monitoring</b>]</i> <i>[If No, proceed to task 4.6, <b>Site Closeout</b>]</i>

## 4.5 Long-Term Monitoring (LTM)

The process for Long-Term Monitoring is graphically shown in Figure 4.5 with accompanying task guidance and information in Table 4.5. See Section 4.7 for a discussion of integration of corrective action and regulated unit closure requirements.



Figure 4.5. Long-Term Monitoring (RCRA)



**TABLE 4.5 LONG-TERM MONITORING (RCRA)**

*This Table accompanies Figure 4.5, Long-Term Monitoring (RCRA)*

TASK NUMBER	TASK NAME	LEAD	COORD./ CONCUR	TASK GUIDANCE AND INFORMATION
	<b>LONG-TERM MONITORING (RCRA)</b>			
4.5-1	Review and amend (if necessary) post-closure monitoring and maintenance plan	RPM/BEC		<input type="checkbox"/> The post-closure plan under §§264/265.118 must include: <ul style="list-style-type: none"> <li>• A description of planned groundwater monitoring activities.</li> <li>• A description of planned maintenance activities.</li> <li>• The name, address, and telephone number of the person or office to contact during the post-closure period.</li> </ul> <input type="checkbox"/> Permitted facilities must submit the post-closure care plan as part of the post-closure permit application. An amendment to the plan requires a permit modification. <input type="checkbox"/> Post-closure monitoring (LTM) should be optimized, taking into account decision criteria, field procedures, analytical protocols, and data management plans. <p><b>Community Involvement</b></p> <input type="checkbox"/> For a list of activities you may want to consider, refer to Section 7.0, Community Involvement.
4.5-2	Implement compliance monitoring or post-closure care in accordance with permit/plans	RPM/BEC		<p><b>Community Involvement</b></p> <input type="checkbox"/> For a list of activities you may want to consider, refer to Section 7.0, Community Involvement.
4.5-3	Implement long-term site management strategies	RPM/BEC		<input type="checkbox"/> Since the LTM phase potentially represents a different level of DoD management involvement at a site, the beginning of this phase represents an opportunity to examine historic management strategies in light of likely future requirements. At this point it may be appropriate to consider an alternative site management strategy that is better aligned with the requirements of the LTM phase.
4.5-4	Monitor to determine continued effectiveness of remedy	RPM/BEC		<input type="checkbox"/> These activities also include routine inspections and operation of containment remedies such as landfill caps. <p><b>Community Involvement</b></p> <input type="checkbox"/> For a list of activities you may want to consider, refer to Section 7.0, Community Involvement.
4.5-5	Monitor site for agreed-upon period (based on site conditions)	RPM/BEC		<input type="checkbox"/> Conduct appropriate post-closure care: <ul style="list-style-type: none"> <li>• Maintain waste containment systems (e.g., leachate collection, groundwater interception); and</li> <li>• Conduct detection or compliance groundwater monitoring.</li> </ul> <input type="checkbox"/> Post-closure care generally lasts for 30 years after completion of closure but may be extended or shortened with regulatory approval.

**TABLE 4.5 LONG-TERM MONITORING (RCRA)**

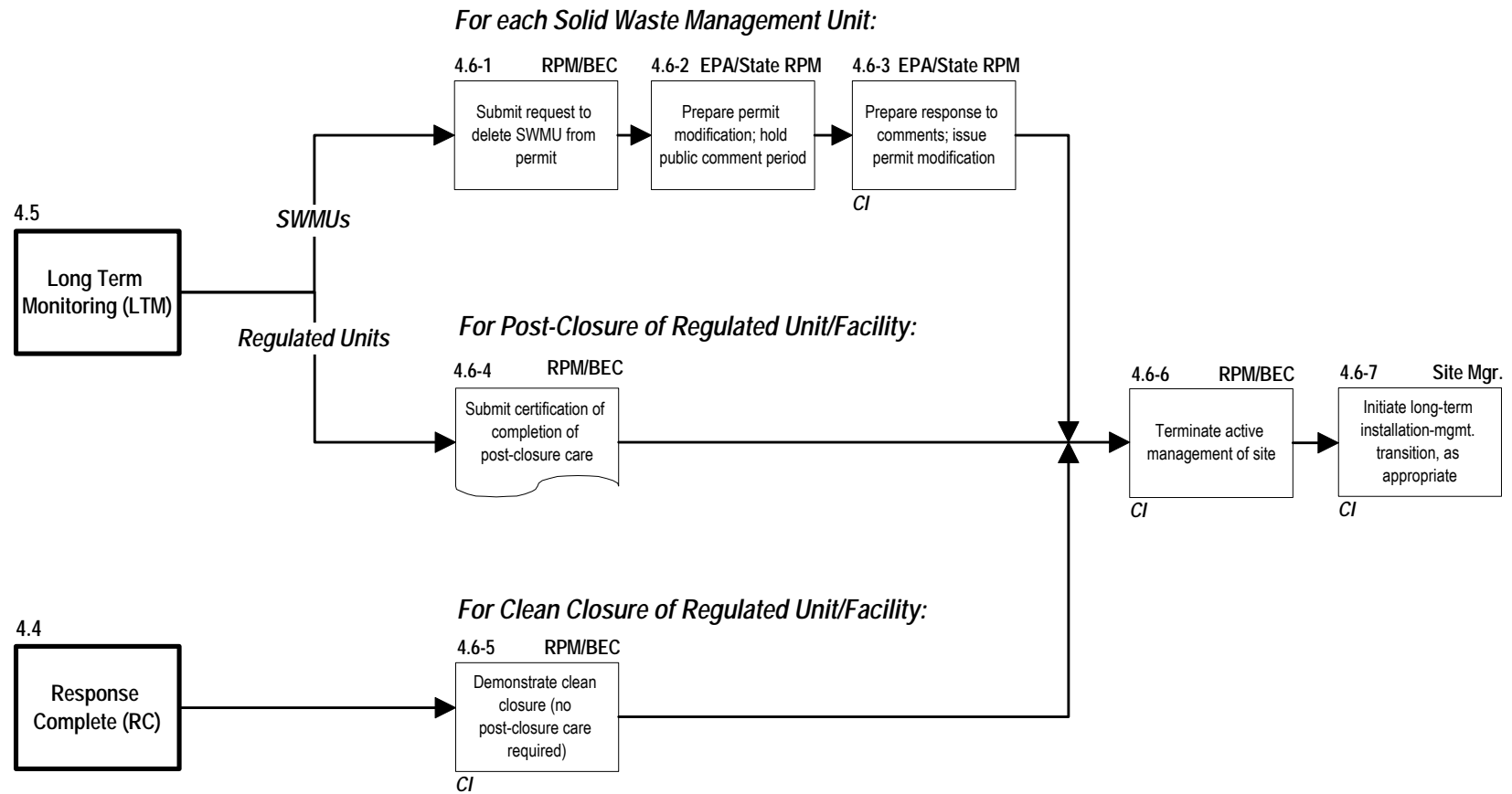
*This Table accompanies Figure 4.5, Long-Term Monitoring (RCRA)*

TASK NUMBER	TASK NAME	LEAD	COORD./ CONCUR	TASK GUIDANCE AND INFORMATION
4.5-6	Modify and/or maintain institutional controls	RPM/BEC		<input type="checkbox"/> Coordinate institutional controls with appropriate local officials/authorities. <input type="checkbox"/> At this point, adjustments may be made to previously-established institutional controls. For example, restrictions related to protection of the RA-O equipment may be lifted when the equipment has been removed and use restrictions necessitated by pre-cleanup contaminant levels may be lifted. <input type="checkbox"/> ICs may be further modified as long-term monitoring progresses; e.g., restrictions to protect monitoring wells may be modified as well numbers and locations change over time. <b>Community Involvement</b> <input type="checkbox"/> For a list of activities you may want to consider, refer to Section 7.0, Community Involvement.
4.5-7	Update Sampling and Analysis Plan (SAP) as appropriate	RPM/BEC		<input type="checkbox"/> The SAP may include the Quality Assurance Project Plan (QAPP), health and safety plan, and other related plans. <input type="checkbox"/> In particular, the SAP should be revisited in light of potentially changing data quality objectives and the possibility of significantly altered sampling and analysis protocols as the site moves into the LTM phase. <input type="checkbox"/> To ensure optimum efficiency of an existing LTM program, the LTM optimization process (see task 4.5) should be reviewed and updated periodically
4.5-8	Is continued LTM required?  <i>[If Yes, proceed to task 4.5-10]</i>	RPM/BEC	EPA/state RPM	<input type="checkbox"/> Documents specifying corrective measures implementation should include methods to determine when remedial goals have been achieved. <input type="checkbox"/> In general, once a unit has completed the post-closure care period, groundwater monitoring may be discontinued. <input type="checkbox"/> Depending on the specific RCRA permit provisions, termination of the post-closure care period may not be based on a set time interval but may instead be determined through performance standards.
4.5-9	Decommission LTM equipment and wells as appropriate	RPM/BEC		<input type="checkbox"/> Once completed, proceed to task 4.6, Site Closeout.
4.5-10	Does LTM indicate the need for further remedial action? <i>[If Yes, return to task 4.3, Remedial Action Operation]</i> <i>[If No, proceed to task 4.5-4]</i>	RPM/BEC		<input type="checkbox"/> Should LTM indicate that the remedy has ceased to be protective of human health and the environment, additional remedial/corrective action may be necessary.

## 4.6 Site Closeout

The process for Site Closeout is shown graphically in Figure 4.6 and is described in greater detail in Table 4.6. See Section 4.7 for a discussion of integration of corrective action and regulated unit closure requirements.

Figure 4.6. Site Closeout (RCRA)



*CI* denotes community involvement

TABLE 4.6 SITE CLOSEOUT (RCRA)

TASK NUMBER	TASK NAME	LEAD	COORD./ CONCUR	TASK GUIDANCE AND INFORMATION
	<b>SITE CLOSEOUT (RCRA)</b>			
<i>For each Solid Waste Management Unit:</i>				
4.6-1	Submit request to delete SWMU from permit	RPM/BEC		<input type="checkbox"/> Description of desired permit modification including description of unit to be deleted from the permit must be submitted to the appropriate regulatory agency (EPA or the state).
4.6-2	Prepare permit modification; hold public comment period	EPA/state RPM		<input type="checkbox"/> The appropriate regulatory agency will prepare the permit modification and initiate the permit modification process. <b>Community Involvement</b> <i>Required</i> <input type="checkbox"/> Solicit public comments on the permit modification (see Section 4.9 and 40 CFR Part 270 for details).
4.6-3	Prepare response to comments; issue permit modification	EPA/state RPM		<b>Community Involvement</b> <i>Required</i> <input type="checkbox"/> Prepare response to comments received during the public comment period. <input type="checkbox"/> For a list of activities you may want to consider, refer to Section 7.0, Community Involvement.
<i>For Post-Closure of Regulated Unit/Facility:</i>				
4.6-4	Submit certification of completion of post-closure care	RPM/BEC		<input type="checkbox"/> No later than 60 days after completion of the established post-closure care period for each hazardous waste disposal unit, the owner/operator must submit to the RA (by registered mail) a certification that the post-closure care period was performed in accordance with the specifications established in the approved closure plan (§§264/265.120).
<i>For Clean Closure of Regulated Unit/Facility:</i>				
4.6-5	Demonstrate clean closure (no post-closure care required)	RPM/BEC		<input type="checkbox"/> In order to demonstrate clean closure (or closure by removal), an owner/operator must show that levels of hazardous contaminants do not exceed EPA-recommended exposure levels, or clean closure levels. <input type="checkbox"/> An owner/operator who cannot clean close must close as a landfill and obtain a permit for the post-closure period (§270.1(c)). In general the post-closure plan will be approved as part of the facility's overall RCRA permit. <b>Community Involvement</b> <input type="checkbox"/> For a list of activities you may want to consider, refer to Section 7.0, Community Involvement.
4.6-6	Terminate active management of site	RPM/BEC		<b>Community Involvement</b> <input type="checkbox"/> For a list of activities you may want to consider, refer to Section 7.0, Community Involvement.
4.6-7	Initiate long-term installation-management transition, as appropriate	Installation Manager		<input type="checkbox"/> Since the Site Closeout milestone represents the termination of active site management by the DoD, the appropriate DoD Component Installation Manager (e.g., Installation Commander or Civil Engineer) should phase out associated management strategies, including transition of affected personnel and functions. <b>Community Involvement</b> <input type="checkbox"/> For a list of activities you may want to consider, refer to Section 7.0, Community Involvement.

## 4.7 Installation Completion

The process for Installation Completion is shown in Table 4.7.

TABLE 4.7 INSTALLATION COMPLETION (RCRA)

TASK NUMBER	TASK NAME	LEAD	COORD./ CONCUR	TASK GUIDANCE AND INFORMATION
	INSTALLATION COMPLETION (RCRA)			
4.7-1	Terminate RCRA permit	RPM/BEC	EPA/state RPM	<input type="checkbox"/> Complete any additional required documentation in order to terminate the RCRA permit or order under which corrective actions were carried out.
4.7-2	Complete long-term installation management strategies	Installation Manager		<input type="checkbox"/> Complete transition of installation personnel and functions <b>Community Involvement</b> <input type="checkbox"/> For a list of activities you may want to consider, refer to Section 7.0, Community Involvement.

## 4.8 Regulated Units vs. Corrective Actions

Closure of regulated units under RCRA and conduct of corrective actions occur under two distinct regulatory processes. There are specific RCRA regulations that set forth how regulated units are permitted or closed, and similarly specific regulations for corrective actions. For example, a closure plan would typically focus on how an individual regulated unit (e.g., landfill) would be closed. This is in contrast to a corrective action, which is generally much broader in scope and addresses all solid waste management units at a facility. Thus, certification of closure for a regulated unit does not necessarily mean that corrective action has addressed all solid waste management units at a facility.

Under RCRA guidance, regulated units are considered to be solid waste management units. This is because the definition of a solid waste management unit is broad, covering any unit that may have managed solid waste. However, the regulatory processes under RCRA for closing a regulated unit and carrying out corrective action for solid waste management units are different. EPA has recognized this issue and has proposed a regulation that would bring the closure and corrective action processes closer together. On November 8, 1994, EPA requested comment on an approach that would reduce or eliminate the regulatory distinction between cleanup of releases from closed or closing regulated units and cleanup of releases from non-regulated units under the RCRA corrective action program (59 FR 55778).

In October 1998, EPA issued a final rule (63 FR 56709) regarding the closure process and the need for post-closure permits at regulated units. The rule introduces new flexibility in two areas:

- Closure requirements at certain regulated units may be replaced with similar, site-specific requirements developed through the corrective action process

- The regulatory requirements of a post-closure permit may be achieved through an enforceable document issued under corrective action authority instead of a permit

The tasks in Sections 4.4, 4.5, and 4.6 discuss regulated units in terms of the traditional closure and post-closure permit process. RPMs and BECs at installations with a RCRA-based program should be aware of this new flexibility and tailor their strategies accordingly. The final rule should allow much-improved integration of the closeout process for corrective actions and regulated units, which will be reflected in subsequent editions of this Guide.

**Closure and “Clean Closure” of Regulated Units (see EPA memorandum “Risk-Based Clean Closure,” March 16, 1998).** EPA issued this memorandum to clarify the meaning of “clean closure” and to emphasize that a risk-based approach could be used to satisfy these requirements. Closure is the term used to describe taking a RCRA regulated unit out of service. During closure, facility owners/operators must comply with the performance standard at 40 CFR 264.111 or 40 CFR 265.111; closure must be completed in a manner that:

- (a) minimizes the need for further maintenance;
- (b) controls, minimizes or eliminates, to the extent necessary to protect human health and the environment, post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated run-off, or hazardous waste decomposition products to ground or surface waters or to the atmosphere; and,
- (c) complies with the unit-specific closure requirements of 40 CFR Part 264 or 265. Generally, two types of closure are allowed—closure by removal or decontamination (referred to here as “clean closure”) and closure with waste in place.

The premise of clean closure is that all hazardous wastes have been removed from a given RCRA regulated unit, and any releases at or from the unit have been remediated so that further regulatory control under RCRA Subtitle C is not necessary to protect human health and the environment. As part of meeting the closure performance standard referenced above, for clean closure, facility owners/operators must remove all wastes from the closing unit and remove or decontaminate all waste residues, contaminated containment system components, contaminated soils (including ground water and any other environmental media contaminated by releases from the closing unit), and structures and equipment contaminated with hazardous waste and hazardous waste leachate.

EPA’s expectation is that, with the exception of landfills and most land treatment units, well-designed and well-operated RCRA units (i.e., units that comply with the unit-specific minimum technical requirements) will generally be clean closed. Units that are not clean closed remain subject to the requirements for post-closure care, including post-closure permitting.

Since 1987, EPA has interpreted the regulations governing closure by removal and the term “remove or decontaminate” to mean that, except for hazardous waste and liners, for clean closure, the regulations do not require one to completely remove all contamination, i.e., to background, at or from a closing unit. Rather, some limited quantity of hazardous constituents might remain in environmental media after clean closure provided they are at concentrations below levels that may pose a risk to human health and the environment.

Procedures and guidance generally used to develop protective, risk-based media cleanup standards for the RCRA corrective action and CERCLA cleanup programs are also appropriate to define the amount of hazardous constituents that may remain in environmental media after clean closure. In other words, site-specific, risk-based media cleanup levels developed under the RCRA corrective action and CERCLA cleanup programs are appropriate levels at which to define clean closure.

In situations where, because of a change in land use, additional cleanup is needed after clean closure, EPA would retain authority to take action, under appropriate circumstances, using RCRA Section 7003, CERCLA Section 106, and other authorities. In addition, until clean-closed facilities undergo final administrative

disposition of a RCRA permit application (i.e., through permit issuance or permit denial) they would remain subject to corrective action under RCRA Section 3008(h).

## 4.9 RCRA Permit Modifications and Site Closeout

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The dynamic process of environmental restoration may require multiple adjustments to be made to a corrective action program in order to adequately and cost-effectively protect human health and the environment. In some cases, these adjustments may be relatively minor (such as a change in the number of monitoring wells), or, in extreme cases, may represent a fundamental rethinking of the chosen corrective action (see section 8.2 for a discussion of updating of remedy decisions).

When corrective actions are being conducted under a RCRA permit, these adjustments may require a modification to the permit as mandated by 40 CFR Part 270. Causes for a permit modification include the following:

- Material and substantial alterations or additions to the permitted facility or activity that occurred after permit issuance
- Receipt of information that was not available at the time of permit issuance
- Change, by statute or by judicial decision, of the standards or regulations on which the permit was based
- Events over which the permittee has little or no control that may cause a modification of compliance schedules

In addition, a permit may be modified, or revoked and reissued, if there is a proposed transfer of the permit to a new owner/operator.

Depending on the scope of the proposed change, the administrative and regulatory requirements for executing the permit modification can vary substantially. Permit modifications are grouped into three classes, according to the modifications' potential impacts:

**Class 1** modifications apply to minor changes that keep the permit current with routine changes to the facility or its operation. The permittee generally must notify the regulatory agency concerning the Class 1 modification within 7 calendar days after the change is put into effect, and send notice to the facility mailing list within 90 days. Certain Class 1 modifications, however, require prior written approval by the regulatory agency.

**Class 2** modifications apply to changes that are necessary to enable a permittee to respond, in a timely manner, to common variations in the types and quantities of the wastes managed under the facility permit, technological advancements, and changes necessary to comply with new regulations. Class 2 modifications entail a more substantial approval process, including significant community involvement requirements. The permittee must submit the proposed modification to the regulatory agency, send notice to the facility mailing list, hold a 60-day public comment period, conduct a public meeting, and make the proposed modification publicly available. The Class 2 process includes opportunities for revision and resubmission of the proposed modification, and the modification is automatically authorized if the regulatory agency does not approve or deny it after a set period.

**Class 3** modifications substantially alter the facility or its operations. Requirements for Class 3 modifications are similar to those for Class 2 modifications, including the same community involvement requirements. However, the information required for submission of a Class 3 modification is greater than that for a Class 2 modification, and the regulatory agency is required to make an approval or denial decision within an allotted time period.



Permittees may also request temporary authorization to proceed with a Class 2 or Class 3 modification pending a regulatory decision on the proposed modification. Full details of the permit modification process are described in 40 CFR § 270.42.

Table 4.9 provides examples of certain types of permit modifications that are relevant to site closeout, along with their classifications. Restoration project teams should assess the applicable permit modifications required during optimization of corrective actions and plan activities accordingly.

**Table 4.9 Examples of Classifications of Permit Modifications Relevant to Site Closeout**

Modification Types*	Class
<b>General Permit Provisions</b>	
Administrative and informational changes	1
Correction of typographical errors	1
Equipment replacement or upgrading with functionally equivalent components	1
Changes in the frequency of or procedures for monitoring, reporting, sampling, or maintenance activities by the permittee:	
To provide for more frequent monitoring, reporting, sampling, or maintenance	1
Other changes	2
Changes in expiration date of permit to allow earlier permit termination	1 <sup>1</sup>
Changes in ownership or operational control of a facility	1 <sup>1</sup>
<b>General Facility Standards</b>	
Changes to waste sampling or analysis methods	1, 1 <sup>1</sup> or 2
Changes to analytical quality assurance/control plan	1 or 2
Changes in frequency or content of inspection schedules	2
Contingency plan:	
Changes in emergency procedures	2
<b>Ground-Water Protection</b>	
Changes in the number, location, depth, or design of upgradient or downgradient wells of permitted ground-water monitoring system	2
Replacement of an existing well that has been damaged or rendered inoperable	1
Changes in ground-water sampling or analysis procedures or monitoring schedule, with prior approval	1 <sup>1</sup>
Changes in point of compliance	2
Changes in indicator parameters	3
Changes to a detection monitoring program	2
Compliance monitoring program:	
Addition of compliance monitoring program	3
Changes to a compliance monitoring program	2
Corrective action program:	
Addition of a corrective action program as required by 40 CFR §§264.99(i)(2) and 264.100	3

**Table 4.9 Examples of Classifications of Permit Modifications Relevant to Site Closeout**

Modification Types*	Class
Changes to a corrective action program	2
<i>Closure</i>	
Changes in the closure schedule for any unit	1 <sup>1</sup>
Changes in the expected year of final closure	1 <sup>1</sup>
Changes in procedures for decontamination of facility equipment or structures	1 <sup>1</sup>
Changes in approved closure plan	2
Extension of the closure period	2
<i>Post-Closure</i>	
Extension of post-closure care period	2
Reduction in the post-closure care period	3
Changes to the expected year of final closure	1
Changes in post-closure plan	2
<i>Landfills and Unenclosed Waste Piles</i>	
Addition or modification of a liner, leachate collection system, leachate detection system, run-off control, or final cover system	3
Modification of a landfill unit without changing a liner, leachate collection system, leachate detection system, run-off control, or final cover system	2
Modification of a landfill management practice	2
Changes in response action plan:	
Increase in action leakage rate	3
Change in a specific response reducing its frequency or effectiveness	3
Other changes	2

\*Partial list; for a comprehensive list, see 40 CFR § 270.42, Appendix I

<sup>1</sup> Class 1 modifications requiring prior regulatory agency approval.